

TABLE 3B.—Maximum free air wind velocities (m. p. s.) for different sections of the United States based on pilot-balloon observations during the year 1944

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast ¹	50.8	NW.	2,265	Jan. 30	New York, N. Y.	68.0	WNW.	4,220	Dec. 28	Albany, N. Y.	90.0	NW.	10,903	Apr. 23	Calibou, Maine.
East-Central ²	48.0	E.	1,164	Oct. 18	Hatteras, N. C.	67.0	WSW.	5,000	Jan. 29	Huntington, W. Va.	86.4	WNW.	15,879	Oct. 30	Huntington, W. Va.
Southeast ³	39.0	NW.	2,500	Dec. 19	Charleston, S. C.	54.4	WSW.	5,000	Mar. 7	Atlanta, Ga.	80.0	WSW.	14,287	Jan. 22	Miami, Fla.
North-Central ⁴	48.5	NNW.	2,152	Dec. 18	Rapid City, S. Dak.	57.6	W.	4,995	Jan. 10	St. Paul, Minn.	85.5	NNW.	7,875	Jan. 22	St. Paul, Minn.
Central ⁵	51.3	W.	1,168	Feb. 5	Joliet, Ill.	54.2	NW.	4,856	Nov. 23	St. Louis, Mo.	68.0	W.	6,603	Feb. 20	Goodland, Kans.
South-Central ⁶	42.4	W.	2,020	Apr. 10	Del Rio, Tex.	49.0	NW.	4,763	Dec. 12	Little Rock, Ark.	85.5	WSW.	11,781	Feb. 2	Big Spring, Tex.
Northwest ⁷	43.5	SW.	2,442	May 15	Burns, Oreg.	61.2	W.	4,221	Mar. 23	Ellensburg, Wash.	81.0	N.	6,711	Mar. 13	Medford, Oreg.
West-Central ⁸	54.6	S.	2,214	Apr. 8	Grand Junction, Colo.	66.0	NW.	4,784	Feb. 14	Sacramento, Calif.	63.8	E.	12,951	Oct. 23	Ely, Nev.
Southwest ⁹	47.0	NE.	2,500	Dec. 4	Mt. Laguna, Calif.	64.3	W.	4,498	Feb. 9	El Paso, Tex.	84.0	WSW.	10,635	Dec. 29	Albuquerque, N. Mex.

¹ Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.

² Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.

³ South Carolina, Georgia, Florida, and Alabama.

⁴ Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.

⁵ Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.

⁶ Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.

⁷ Montana, Idaho, Washington, and Oregon.

⁸ Wyoming, Colorado, Utah, northern Nevada, and northern California.

⁹ Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By C. R. JORDAN

PRECIPIATION during December was above normal in most sections from the central Great Plains southward to the Gulf, much of the Ohio Valley, and New York and Pennsylvania. Rainfall was notably scanty in the Southeast, Central-Northern States, and the western Great Basin.

Floods, extraordinarily high for December, occurred in Kansas as a result of heavy rains in combination with frozen ground and high base flow. Moderately severe floods also occurred in West Virginia as a result of rainfall and melting of snow on December 25 and 26.

Atlantic slope drainage.—Rainfall that averaged about 2 inches fell over eastern North Carolina during the last 4 days of November that produced light overflow of the Neuse, Tar, and Roanoke Rivers during the early part of December. Crests were only a little above flood stage and no damage of consequence occurred.

MISSISSIPPI SYSTEM

Missouri Basin.—Heavy to excessive rains fell over the lower portion of the Grand River basin in the 3-day period December 3–5, 1944. Storm totals exceeded 3.50 inches at reporting stations. Sharp rises resulted; the stage at Chillicothe, Mo., rising from 3.30 feet on December 4 to 27.3 feet on the morning of the 6th. Damage resulting from this overflow was not great.

Unusually severe overflow occurred along the Marais des Cygnes (Osage) River from December 5 to 12, which was the first December overflow of record along that

stream. It was due to torrential rains at and above Ottawa, especially in Osage County. The following report of the overflow was received from the Official in Charge, Weather Bureau Office, Topeka, Kans.

The crest at Quenemo was 36.35 on the 5th, 6.35 feet above bankful, and exceeded only by three previous overflows of record—those of November 1928, with a crest of 38.38; June 1935, with a crest of 36.6; and April 1944, with a crest of 38.1 feet.

At Ottawa this was the fifth greatest overflow of record, with a crest of 33.9 feet, 9.9 feet above bankful, on the 6th. Overflows that exceeded this at this point were those of May 1904, with a crest of 34.3 feet; July 1909, with a crest of 35.9 feet; November 1928, with a crest of 37.6 feet; and April 1944, with a crest of 36.5 feet.

At Osawatomie the crest was 38.8 feet, 10.8 feet above bankful, on the 7th. As this flood crest moved toward the Missouri line, it tended to flatten very materially, with the result that at Trading Post it was 27.14 feet, which was 3.7 feet lower than the crest of April 25, 1944, at that point and 7.3 feet lower than the great crest of November 18, 1928.

The greatest damage occurred at Ottawa, where the rise of the river was very rapid and there were several narrow escapes from drowning. It was estimated that in Ottawa the loss amounted to \$100,000, which was about one-half as great as the loss during the great overflow of April preceding. Approximately 50 families were flooded out of their homes and there was great damage in the business section located near the river, due to flooded basements and also water over the first floor. The passenger and telegraph offices of the Santa Fe Railway were flooded and were abandoned for a few days. Train service over the north-and-south line of the Santa Fe passing through Ottawa and also over the Missouri Pacific was interrupted for a day or two.

Persons forced to leave their homes in the flooded district were, in many cases, sheltered in churches and other buildings.

No other cities along the river are subject to overflow, but there was much damage to the corn crop that had been left in the fields. It was estimated that fully two-thirds of this crop had not been removed from the fields and it was an unusually good crop. Loss to this crop was near 50 percent of the loss during

the record-breaking overflow of 1928. There were also considerable losses of livestock.

The total damage of the flood, according to preliminary estimates which are subject to later revision, was \$326,400, which includes \$98,000 municipal damage in Ottawa. A total of 60,930 acres of land was flooded.

Ohio Basin.—High stages and some light flooding occurred in the Tygart River valley on Christmas day and the day following as a result of run-off from moderate rainfall that was augmented by melting of a rather heavy snow cover over the area. Flood stages were slightly exceeded at a few points but very little damage resulted. The same conditions produced moderate flood stages of the Monongahela on the 26th. Only minor damage was reported.

Moderately heavy rainfall in northern West Virginia on December 24–25, brought a sharp rise to above flood stage in the Little Kanawha River. At Glenville the crest was 4.2 feet above flood stage and at Creston 2.75 feet above flood stage. This was followed on the 27th by another rain of slightly more than an inch that brought a crest near flood stage at Glenville and 2.8 feet above flood stage at Creston. Little if any damage resulted.

Arkansas Basin.—Unusually heavy December rains produced stages considerably above flood stage on the Cottonwood and Neosho Rivers, about flood stage on the Arkansas at Arkansas City, Kans., and Ralston, Okla., and slightly under flood stage at Oxford, Kans. During the 3-day period, December 2–5, precipitation over the Cottonwood Basin ranged from nearly 3 inches in the headwaters to 5 inches at Emporia, Kans., and in the Neosho Basin, amounts ranged from over 4 inches at Council Grove, Kans., to slightly more than 1 inch at Oswego, Kans. Heavy rains, averaging about 3 inches, were reported from the same storm over the Verdigris and Walnut River Basins and in the immediate vicinity of Arkansas City and Oxford, Kans. The combination of rain falling on frozen ground with high base flows already prevalent produced floods that were extraordinarily high for December. The Cottonwood and upper Neosho Rivers reached stages within a foot or two of those reached in the destructive and record-breaking stages of April 1944. Minor flooding occurred along Bird Creek and Caney River; in the vicinity of Arkansas City, Kans., and Ralston, Okla.; and on the Walnut River at Eldorado, Augusta, and in the vicinity of Winfield, Kans.

Considerable damage resulted from the overflow, occurring mostly in the Cottonwood below Florence, Kans., and along the Neosho from Emporia to Iola, Kans.

Red Basin.—Heavy rains, totaling more than 5 inches at some stations from December 5–7, caused rises on the Saline, Ouachita, and Sulphur Rivers to crests that were slightly above flood stages. Very little loss resulted from the flood.

Additional heavy rains were general over much the same area during the last week of December and the Ouachita and Sulphur Rivers again overflowed. The flooding continued into January and will be discussed more fully in the report for next month.

West Gulf drainage.—Moderately heavy rain over western Louisiana and eastern Texas during the last few days of December caused rises in the streams of that area with light overflow at a few points along the Calcasieu, Trinity, and Guadalupe Rivers. No damage was reported except along the lower Trinity River where the loss is estimated at \$6,000.

FLOOD-STAGE REPORT FOR DECEMBER 1944

[All dates in December unless otherwise specified]

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	<i>Feet</i>				<i>Feet</i>
Roanoke: Williamston, N. C.-----	10	{ 4	6	10.3	5
Tar:		15	17	10.1	18
Rocky Mount, N. C.-----	9	2	2	9.1	2
Tarboro, N. C.-----	18	4	4	18.0	4
Greenville, N. C.-----	13	5	7	13.4	5
Neuse:					
Neuse, N. C.-----	14	Nov. 28	3	17.0	1
Smithfield, N. C.-----	13	Nov. 29	4	16.8	2
Cape Fear: Lock No. 2, Elizabeth- town, N. C.-----	20	1	3	21.6	2
MISSISSIPPI SYSTEM					
<i>Missouri Basin</i>					
Grand:					
Gallatin, Mo.-----	20	5	6	21.3	5
Chillicothe, Mo.-----	18	5	7	27.3	6
Brunswick, Mo.-----	12	6	9	13.5	6
Osage:					
Quenemo, Kans.-----	30	4	7	36.4	5
Ottawa, Kans.-----	24	5	8	33.9	6
Oswatomie, Kans.-----	28	5	10	38.8	7
La Cygne, Kans.-----	25	6	11	30.2	9
Trading Post, Kans.-----	24	6	12	27.2	10
<i>Ohio Basin</i>					
Tygart: Philippi, W. Va.-----	17	25	26	19.6	26
West Fork:					
Weston, W. Va.-----	17	25	26	19.0	26
Clarksburg, W. Va.-----	5	25	27	8.4	28
Middle Fork: Midvale, W. Va.-----	11	26	26	12.0	26
Monongahela:					
Lock No. 7, Greensboro, Pa.-----	30	25	26	33.7	26
Lock No. 4, Charleroi, Pa.-----	30	26	26	31.1	26
Lock No. 2, Braddock, Pa.-----	20.5	26	28	27.0	27
Little Kanawha:					
Glenville, W. Va.-----	23	25	26	27.2	26
Creston, W. Va.-----	20	26	27	22.8	27
<i>Arkansas Basin</i>					
Little Arkansas: Sedgwick, Kans.-----	18	5	6	23.2	5
Walnut:					
Eldorado, Kans.-----	9	4	5	10.6	5
Winfield, Kans.-----	23			31.9	7
Cottonwood:					
Cottonwood Falls, Kans.-----	9	4	7	15.0	5
Emporia, Kans.-----	20	4	10	26.0	6
Neosho:					
Council Grove, Kans.-----	24			25.1	5
Neosho Rapids, Kans.-----	22	5	9	27.6	5
Burlington, Kans.-----	27	4	10	34.3	6
LeRoy, Kans.-----	23	4	10	27.5	7
Iola, Kans.-----	15	5	12	21.1	8
Chanute, Kans.-----	20	5	12	27.7	10
Parsons, Kans.-----	22	7		26.5	14
Oswego, Kans.-----	17	6	15	23.05	14
Petit Jean: Danville, Ark.-----	20	8	10	21.2	9
Arkansas:					
Arkansas City, Kans.-----	16	5	7	16.85	6
Ralston, Okla.-----	16	7	7	16.0	7
<i>Red Basin</i>					
Saline: Benton, Ark.-----	20	7	7	22.0	7
Ouachita:					
Arkadelphia, Ark.-----	17	{ 7	9	19.8	7
		26	27	17.7	26
		27	30	19.3	29
Camden, Ark.-----	26	{ 10	15	28.4	13
		29	(3)		
Sulphur:					
Hagansport, Tex.-----	38	{ 6	6	38.7	6
		8	8	38.2	8
		27	31	39.7	28
Naples, Tex.-----	22	{ 9	15	24.1	12
		30	(3)		
WEST GULF OF MEXICO DRAINAGE					
Calcasieu: Kinder, La.-----	16	29	31	16.4	29
East Fork: Rockwall, Tex.-----	10	28	(3)		
Trinity:					
Trinidad, Tex.-----	28	30	(3)		
Liberty, Tex.-----	24	7	12	26.2	10
Guadalupe: Gonzales, Tex.-----	20	7	7	20.8	7

¹ Provisional.

² Estimated, water over gage.

³ Continued at end of month.